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(54) SURFACE-TREATMENT OF SUBSTRATE, SURFACE-TREATING APPARATUS, COATING AND COATER

(57)Abstract:

**PROBLEM TO BE SOLVED:** To obtain a substrate subjected to physical surface treatment, having sufficiently high film-deposition property, enabling the application of a coating liquid at a high speed and the stable application of plasma treatment to the continuously moving substrate, free from damages on the plasma-treated substrate and giving sufficiently high film-forming property on the substrate subjected to flame-plasma treatment.

**SOLUTION:** The hydrogen bond component  $\gamma_h$  of the surface energy of a substrate subjected to physical surface treatment is adjusted to  $\geq 8$  mN/m and the lowering of the non-polar component  $\gamma_d$  of the surface energy is adjusted to  $\leq 7$  mN/m. A static elimination treatment is applied to the substrate prior to the plasma treatment. From the plasma treatment to the coating, the substrate is transported without contacting the plasma-treated surface or contacting the surface with an elastic layer formed on the circumference of a roller. An inert gas heavier than helium, i.e. neon or heavier gas, is introduced into a combustion gas for the flame plasma treatment.

